

# New Systems for Old Age Security

## Theory, Practice, and Empirical Evidence

*Estelle James*

Initial empirical investigations suggest that countries concerned about growth should consider pension reform a potentially powerful tool for improving the welfare of both old and young.

**FILE COPY**

The World Bank  
Policy Research Department  
Poverty and Human Resources Division  
May 1997



## Summary findings

James summarizes the major findings and recommendations in *Averting the Old Age Crisis*, describing problems in traditional pension systems and proposals for reform. Then she describes how those reforms are being implemented in many countries and examines empirical evidence about pension reform's impact on growth.

Since the publication of *Averting the Old Age Crisis*, the move toward multipillar systems has accelerated around the world, spurred by demographic and economic forces.

In addition, research has been carried out on some of the critical assumptions underlying the recommendations

in the report. Researchers have begun to quantify the effects of a full or partial shift to a funded defined-contribution plan on the supply and allocation of labor, on national saving, and on the development of financial markets.

Results from the studies that have been done so far on the (anticipated and actual) effects of pension reform (in Argentina, Australia, Mexico, Switzerland, the United Kingdom, the United States, and especially Chile) suggest that pension reform can have and has had a positive, possibly large, impact on national saving and the development of financial markets and hence on economic growth.

---

This paper — a product of the Poverty and Human Resources Division, Policy Research Department — was prepared for the EDI Conference on Pension Reform, November 1996. Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Selina Khan, room N8-024, telephone 202-473-3651, fax 202-522-1153, Internet address [skhan@worldbank.org](mailto:skhan@worldbank.org). May 1997. (41 pages)

*The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the view of the World Bank, its Executive Directors, or the countries they represent.*

**NEW SYSTEMS FOR OLD AGE SECURITY--THEORY, PRACTICE AND EMPIRICAL EVIDENCE**

by

Estelle James,  
Lead Economist, Policy Research Department  
World Bank

Paper prepared for EDI Conference on Pension Reform, November 1996



## Table of Contents

Abstract . . . . .	i
I. The Problems . . . . .	3
II. The Recommended Multi-Pillar System . . . . .	4
III. How Have Countries Reformed? How Have They Financed the Transitions? . . . . .	9
IV. Growth Effects of Old Age Systems: How Large are They? . . . . .	16
V. Conclusion . . . . .	29
<b>Figures</b>	
Figure 1: Percentage of Population Over 60 Years Old, by Region 1990 and 2030 . . . . .	31
Figure 2: Number of Years Required to Double the Share of the Population over 60 from 9 to 18 Percent, in Selected Countries . . . . .	32
Figure 3: Coverage (Contributors/Labor Force) Relationship of the Income per Capita and Coverage . . . . .	33
Figure 4: Relationship Between Percentage of the Population over 60 Years Old and Public Pension Spending . . . . .	34
Figure 5: Demographics Aside, Public Pension Spending is usually Lower in Countries with Big Private Pension Sectors . . . . .	35
Figure 6: The Pillars of Old Age Income Security . . . . .	36
Figure 7: Gross Average Annual Investment Returns for Selected Pension Funds, 1980s . . . . .	37
Figure 8: Relationship between Percentage of the Population over 60 Years Old and Public Pension Spending . . . . .	38
<b>Tables</b>	
Table 1 . . . . .	39
Table 2 . . . . .	40
References . . . . .	41



## NEW SYSTEMS FOR OLD AGE SECURITY--THEORY, PRACTICE AND EMPIRICAL EVIDENCE

Over the next 35 years, the proportion of the world's population that is over age 60 will nearly double, from 9% to 16% (Figure 1). Due to rapid increases in life expectancy and declines in fertility rates, populations are aging much faster in developing countries than they did in industrial countries (Figure 2). As young working-age people near retirement--around the year 2030--80% of the world's old people will live in what today are developing countries. Therefore, these countries need to begin thinking about how they will care for their older populations. And, given their rapid aging, it is essential that they get this right from the start. The World Bank report on old age security, Averting the Old Age Crisis, was prepared with this need in mind. In this paper I summarize its major findings and discuss some of the pension reforms and empirical studies that have been carried out since that report was written.

Population aging is welcome because it indicates that many people have an opportunity to live longer and healthier lives. But it also creates problems, because the working age population must now support a growing number of people who are no longer actively generating economic output. And it generates fiscal pressures for the government.

While the informal family system cares for the old in traditional societies, as economic development and urbanization proceed the family support system breaks down and formal systems, often publicly financed, take over. These formal systems typically provide a stream of income, called pensions or annuities, to old people in lieu of wages or family support. Cross-sectional analysis shows that coverage under formal pension plans is closely tied to per capita income and public spending on pensions increase exponentially as populations age. It now exceeds 15% of GNP in some industrialized countries and will do so in many more countries as the demographic transition proceeds (Figures 3 and 4).

With such large sums involved, how this money is generated and spent can affect the entire economy, by influencing factor supplies, productivity and

therefore the size of the GNP pie. For example, it appears that countries with higher private pension spending and assets have lower public spending, and these two types of spending may have different effects on the broader economy (Figure 5). Therefore, we argue that two over-arching criteria should be used to shape and evaluate these programs: they should protect the old (in an equitable way) and they should promote (or at least not hinder) economic growth--which is important both for the old and the young.

Since growing old is a predictable life experience, that most of us will have with a high probability, a large part of old age security can be provided by self-insurance--people saving for themselves, shifting consumption from their younger productive years to their older years when consumption exceeds income. This reduces many of the incentive problems associated with taxes, transfers and insurance. But another part of old age security systems requires pooling risks and insuring or redistributing across individuals--because some people will retire early due to disability, die young and leave dependents, live longer than average and run out of resources, or earn very low lifetime incomes which are insufficient to support them for their nonworking as well as their non-working lives.

Averting the Old Age Crisis recommends that a combination of mandatory self-insurance and insurance across individuals should be used, in a system that puts greater emphasis on saving, that has separate financing and managerial mechanisms for redistribution and saving, and that shares responsibility between the private and public sectors. Although structural change is always difficult, the experience of countries that have already instituted these reforms shows that it is possible, but it takes somewhat different forms in different countries, and it usually involves spreading the transition costs by swapping implicit for explicit debt that is gradually paid off over several generations. Preliminary evidence suggests a large positive impact on growth.

This paper describes the almost universal problems we found with the dominant system today, sets forth our recommendations for the system of tomorrow,



discusses the way these reforms are now being implemented in many countries, and examines empirical evidence on the growth impact of pension reform.

## I. The Problems

Most formal systems of old age security today are publicly managed, pay "defined benefits" that depend on the worker's earnings rather than contributions, and are financed by payroll taxes on a pay-as-you-go (PAYG) basis --meaning that today's workers are taxed to pay the pensions of those who have already retired. Averting the Old Age Crisis documents in great detail the many problems we found with these systems. These problems include:

- high and rising payroll tax rates that may increase unemployment;
- evasion and escape to the informal sector, where workers may be less productive;
- early retirement, which reduces the supply of experienced labor;
- misallocation of public resources, as scarce tax revenues are used for pensions rather than for education, health or infrastructure;
- lost opportunity to increase long term saving, which are considered to be too low in many countries;
- failure to redistribute to low income groups;
- unintended inter-generational transfers (often to high income groups); and
- the growth of a large hidden implicit public pension debt which, together with the abuses mentioned above, makes the current system financially non-sustainable in many countries.

As a result, existing systems have not always protected the old, they especially will not protect those who grow old in the future, they often have not distributed their benefits in an equitable way, and they have hindered economic growth. In addition, they are simply not sustainable in their present form.

Now, each of these problems was not found in every country, but every country we examined--both developing and industrialized--exhibited most of these problems. This led us to believe that these problems were not accidental, but

rather they were inherent in the economics and politics of PAYG defined benefit schemes, which make it easy for politicians to promise short run benefits at the expense of large long run costs. A new system is needed that is more immune to these dangers.

## **II. The Recommended Multi-Pillar System**

In place of existing systems, Averting recommends a multi-pillar system that is partially funded, that utilizes private management of these funds (which constitute peoples' retirement savings), and that has a separate public tax-financed mechanism for redistributing to low income workers. Specifically, our preferred system contains three pillars (Figure 6):

- a mandatory publicly-managed tax-financed pillar for redistribution,
- a mandatory privately-managed fully funded pillar for saving, and
- a voluntary pillar for people who want more protection for old age.

The first pillar would resemble existing public pension plans in that it would be publicly managed, defined benefit (DB) and tax-financed. However, unlike most current systems, the reformed public pillar would focus on redistribution--providing a social safety net for the old, particularly the old whose lifetime income was low. This recommendation is based on a value judgement that redistribution to alleviate poverty is socially desirable and a technical recognition that redistribution is the function that uniquely requires public financing and control; for everything else, we must give careful attention to market alternatives. The benefit formula could be flat (uniform for everyone or related to years of covered employment), as in Argentina and the U.K., means- and asset-tested (as in Australia) or could provide a minimum pension guarantee (as in Chile). Holding the flat benefit and minimum guarantee equivalent, the last alternative is obviously cheaper while the first provides additional co-insurance and redistribution to lower middle class workers. The tax base should be as broad as possible--such as general revenue finance where coverage is almost universal (as in industrialized countries), or a payroll tax with a high ceiling on taxable

earnings where coverage is limited (as in most developing countries). Because of its limited scope and broad tax base, tax rates to support this pillar would be much lower and less distortionary than the public system requires in most countries today.

**The second pillar** would differ dramatically from most existing systems. It would be mandatory, would link benefits actuarially to contributions as in a defined contribution (DC) plan, where contributions and investment income accumulate and eventually are converted into the person's retirement annuity. It would be fully funded and the funds would be privately and competitively managed. Essentially, people would be required to save for their old age, and this pillar would handle their savings. Let me explain the reasons why a mandatory defined contribution funded privately-managed pillar should be an important part of an old age system.

**Why mandatory?** For the same reason that current systems are mandatory--because a significant number of people may be shortsighted, may not save enough for their old age on a voluntary basis, and may become a burden on society at large when they grow old.

**Why link benefits to contributions?** To discourage evasion, escape to the informal sector and other labor market distortions, since people are less likely to regard their contribution as a tax. And those who do evade bear the cost in the form of lower benefits rather than passing the costs on to others and undermining the financial viability of the scheme, as when benefits and contributions are not closely linked. For similar reasons, defined contribution plans are likely to deter early retirement and to raise the normal retirement age automatically as longevity increases--without a difficult political decision.

**Why fully funded?** First, to make costs clear up front so countries won't be tempted to make promises today that they will be unable to keep tomorrow. Unrealistic benefit rates have often been set at the beginning of PAYG schemes because their costs are hidden and postponed, but as the years pass these costs become much more prominent, they increase exponentially and countries find themselves saddled with a huge fiscal burden. Full funding from the start

diminishes the future tax increases that will be needed, gives a reality-check to pension promises and thereby helps to avoid this dilemma.

Second, funding prevents inadvertently large intergenerational transfers from young people to older workers. Once an unfunded system is set in motion, intergenerational transfers occur automatically as a result of the aging and maturation process, sometimes in ways that people did not expect and would not have chosen after an open discussion. For example, because of the benefit and financing formulas commonly used, some of the gainers are rich people in the earlier generations while some of the losers are poor people in the later generations. Full funding eliminates such inter-generational transfers, unless an explicit decision is made to give them.

Third, full funding for the second pillar may be used to help build long term national savings and to help finance future pensions out of the returns to this saving. It is sometimes argued that savings are irrelevant to old age security because the consumption of future retirees can only be supported by the output of future workers. However, this common belief is overly simplistic: savings can enhance the productivity and therefore the output of future workers, they can be imbedded in consumer durables that continue to provide a stream of services, and they can be invested abroad, then redeemed to finance an inflow of consumer goods. Thus, saving can be an important ingredient of a long run strategy for providing additional domestic consumption when the dependency rate increases. Additional saving is especially important in countries where the saving rate is relatively low to begin with, because of myopia or distortionary taxes on investment returns.

**Why privately managed?** To maximize the likelihood that economic rather than political objectives will determine the investment strategy, thereby producing the best allocation of capital and the highest return on savings; and to help countries (especially middle income countries) develop their financial markets. The experience of many countries, including countries that are now in transition, indicates that governments are not the best allocators of national capital. More specifically, the available data show that publicly managed pension reserves

fared poorly and in many cases lost money throughout the 1980's--largely because public managers were required to invest in government securities or loans to failing state enterprises, at low nominal interest rates that became negative real rates during inflationary periods (Figure 7). Clearly this poses a problem for the pension funds.

It also poses a problem for the economy as a whole if the hidden and exclusive access to these funds makes it easier for governments to run large deficits or to spend more wastefully than they could if they had to rely on a more accountable source of funds. Even if the current government is fiscally responsible future governments may not be, and the accessibility of publicly managed pension reserves enables them to spend without taxing or borrowing through the market.

Competitively managed funded pension plans, in contrast, are more likely to be invested in a mixture of public and corporate bonds, equities and real estate, thereby earning a higher rate of return. Governments can still borrow, but they do so through the market in a more transparent way. Private pension funds can enjoy the benefits of investment diversification, including international diversification, that enables them to increase their yield and reduce their risk, by protecting them from inflation and other country-specific risks. They spur financial market development, by creating a demand for new financial instruments and institutions. These private pension funds could take the form of personal saving plans where the worker chooses the investment manager, as in Chile and Argentina, or of occupational plans where the employer and/or union chooses, as in Australia, Switzerland, Denmark and the Netherlands.

**(But two caveats:** countries must have at least rudimentary capital markets before they can put the funded pillar in place, and considerable government regulation and regulatory capacity are need in order to prevent fraud and excessive risk. These caveats mean that some countries must move very slowly toward a funded pillar for mandatory retirement saving; but these same countries would probably abuse a large PAYG public pillar. The best course for them is to

continue to rely heavily on the informal family system, while building their formal old age programs slowly and carefully.)

A third pillar, voluntary saving and annuities, would offer supplemental retirement income for people with the means and inclination to save more. An important public policy issue here: Should governments offer tax incentives for voluntary saving and annuities: The answer depends on whether such incentives are consistent with the country's over-all tax policy toward consumption versus saving, since special incentives for retirement accounts could otherwise lead to a shift of assets, with no net increase in voluntary saving for the individual or for the economy as a whole.

All three pillars would co-insure against the many risks that old people face. For example, each pillar could include a mechanism for handling specific risks, such as the risks of disability, early death with survivors and above average longevity--or else insurance against these risks could be concentrated in one of the mandatory pillars. Most important, all three pillars together would co-insure against the generalized risk stemming from uncertainty about the future economy or polity--such as breakdowns of the government or the market, changes in relative prices of labor and capital, deterioration in the position of a particular country--by diversifying across types of management (public and private), sources of finance (from labor and capital) and investment strategies (equities and bonds, domestic and international). Risk diversification is especially important given the long time periods and great uncertainty involved. Whatever unpredictable disasters occur in the future--as they surely will--this diversified system is most likely to continue providing protection for the old, according to the old adage--don't put all your eggs in one basket. (For a quantification of the welfare gains from diversification see Pujol 1996). In fact, most upper income people have very diversified sources of old age income, including privately managed investment income, while lower income groups have been forced to rely heavily on publicly managed PAYG programs. We believe that the national mandatory plan should also give these lower income groups the benefits of risk diversification.

**Political implications.** Finally, it would be naive to ignore the fact that the partial replacement of a publicly managed program by privately managed funds also has political and ideological implications. It changes the balance of power in society, taking influence and jobs away from bureaucrats and others who control the public programs and shifting them to private entrepreneurs. It inculcates the ethos of personal responsibility and makes each worker a little capitalist--which may be good or bad, depending on your point of view. While Averting the Old Age Crisis and this paper concentrate on the economic factors, these political and ideological factors probably have much to do with the way pension reform has been received and whether or not it has succeeded, in different countries.

### **III. How Have Countries Reformed? How Have They Financed the Transition?**

During the past decade, with the pace accelerating during the past five years, several countries have adopted variations on this multi-pillar system. We have learned from this experience that pension reform is possible, even in democracies, but it takes somewhat different forms in different countries, as a result of their different initial conditions (e.g. how large was their old implicit pension debt) and political economies (e.g. how strong are their social security bureaucrats, pensioner organizations and labor unions?). For example, these factors led Argentina to choose a relatively large public pillar while in Peru there is no public pillar at all, at present. They led Chile and Australia to choose a much larger private pillar than Mexico. Further, in Chile the terms of trade (i.e. the benefit and contribution rates under the two systems and the terms of the recognition bonds) made it very attractive for workers to switch when given a choice, while this is less the case in Colombia and Peru.

I will refer in this section to the implicit pension debt (IPD)--the present value of the pension promises that are owed to current pensioners and to workers according to their years of participation in the old system. The IPD is inherent in DB PAYG systems, where workers expect to get a specified pension in

return for their contributions, but assets are not accumulated to cover this; instead the obligation is covered by implicit IOU's of the government. (This contrasts with funded DC systems, where pensions are fully covered by assets). The IPD exceeds the explicit debt (backed by government bonds) in many countries and exceeds 200% of GNP in some cases (Figure 8 and Table 1). It is especially large in countries with high coverage, generous benefits and older populations. Since governments cannot easily renege on these obligations, they have a large impact on whether and how countries have reformed; reform often converts (part of) the IPD into explicit debt. Most developing countries have small IPD's because of their low coverage rates, and are therefore in the enviable position of being able to change their systems before the debt becomes unmanageable.

**The Latin American versus the OECD models.** Broadly speaking, three different approaches toward structural reform may be discerned--the Latin American model, the "bold" OECD model (Australia, Switzerland, Denmark and the U.K.) and the "partial" European model (Sweden, Italy, Latvia, the Czech Republic). The Latin American model was pioneered by Chile in 1980 and, bolstered by its initial success, was closely followed by Argentina, Peru, Colombia, Mexico and Uruguay in the 1990's. It is now under consideration in Nicaragua, El Salvador, Bolivia and Costa Rica. In this model, workers get to choose the investment managers of their own individual accounts.

By comparison, in the OECD model, where many employer-sponsored pension plans have long existed on a voluntary basis, they have become the foundation for the mandatory second pillar and a combination of employer and union trustees get to choose the investment manager for each company or occupational group as a whole. (In the U.K. a hybrid model exists--employers are permitted to opt out of the state earnings-related plan, while workers are permitted to opt out of their employer's plan in favor of their own personal retirement plan).

As another important difference--most of the OECD countries with bold reforms had a modest redistributive public pillar with a small IPD when they started their new system, so they could simply retain it and start the second pillar on top of that. The second pillar immediately became mandatory for all



covered workers. (In the U.K. and Denmark, a partial phase-out or downsizing of the earnings-related state plan is involved, but the basic flat benefit remains).

In contrast, the Latin American countries had bloated public pillars and high contribution rates to start out. Thus, the second pillar had to replace part of the public pillar and the latter had to be downsized and redesigned. When a worker switched to the new system, he was given credit for his past service under the old system (as by recognition bonds in Chile or compensatory pensions in Argentina), while part of his future contributions were diverted to the second pillar of the new system. How could these countries find the money to continue paying the promised benefits to current pensioners and older workers (the IPD) under the old system, while part of the payroll tax flowing in was diverted to funded individual accounts? This revenue gap has become known as the problem of "financing the transition."

**Financing the transition in the Latin model.** Some of the strategies that have been used in the Latin American countries to finance the transition are:

1. Before making the transition, reform the old system by downsizing benefits, raising retirement age and penalties for early retirement, tightening eligibility for disability benefits, and changing the indexation method to price indexation, so the outstanding debt, whether implicit or explicit, will be smaller. Chile, Argentina and Uruguay followed this strategy, which may be indispensable to a good pension reform. Otherwise, you run the risk of casting in stone benefit promises that never should have been made in the first place, and making it more difficult than before for the government to escape from these unrealistic promises.

2. Build a pre-existing primary surplus in the general treasury, that can be used to pay off part of the pension debt. Chile did this but most other countries are burdened with fiscal deficits rather than surpluses.

3. If there is a pre-existing surplus in the social security system, use it to pay off part of the debt. While the Latin systems generally did not have a surplus, the U.S. social security trust fund could be used in this way, if the U.S. were to make a transition.

4. If some public enterprises are being privatized, use some of the proceeds to pay off the pension debt--a cancellation of long term assets against long term liabilities. This strategy is being followed by Peru.

5. Keep some workers, and their contributions, in the old system. This may be accomplished by excluding some workers, such as the military or the police, from the new system (as in Chile), or by making the new system attractive mainly to young workers (as in Argentina) or by giving all workers a choice but making the opt-out provisions relatively unattractive. The latter strategy has been followed by Colombia, Uruguay and Peru, which have kept the old system operating side-by-side with the new. The serious danger is that, in order to solve an immediate cash-flow problem, these countries have increased their long term implicit debt; this solution may turn out to be non-viable.

6. Retain part of the old system in a downsized and more redistributive form, as the public pillar of the new system, so that some of the revenue in-flow continues. Argentina followed this strategy, by utilizing a flat benefit in its new public pillar, rather than the narrower minimum pension guarantee as in Chile. In Argentina, about 60% of the total contribution is used to support the flat benefit. In addition, workers can choose between a funded and a PAYG option for the second pillar. The inflow of funds to the first pillar and the PAYG second pillar exceeds the outflow in the short run, and the surplus helps to pay the compensatory pension. But if the public pillar or PAYG second pillar offer benefits that are too generous (actuarially unsound), the reform will not be sustainable in the long run--a danger that Argentina faces.

7. Reduce evasion and increase coverage, thereby increasing system revenues. This was part of Argentina's plan; however, as noted below, the reduced evasion has not yet materialized.

8. Issue recognition bonds that place a value on the debt owed to each worker but that cannot be cashed until the worker retires (as in Chile). Or, even better, promise a compensatory pension that will gradually be paid off over the entire retirement period of the worker (as in Argentina). Both of these methods acknowledge the debt to the worker but postpone the day when cash will be needed.

The issuance of the recognition bonds gives the worker greater certainty that the pension debt will eventually be repaid, since it is a legally binding piece of paper, and in return for reducing uncertainty the government can downsize the face value of the bond (as in Peru).

9. Issue general treasury debt to cover the remaining cash gap. Some of this debt may be sold to the pension funds in the new second pillar and some of it may be external (as in the World Bank's loan to Mexico). Debt finance is an alternative to tax finance and has been used by virtually every reforming Latin country, so that a heavy double burden of contributions is not imposed on the transition generation of workers. The most important proviso is that the pension funds must not be compelled to purchase the bonds, which therefore must pay the market interest rate. (However, all Latin countries limit international diversification, which virtually ensures large investments in domestic government bonds). A second important proviso is that a credible mechanism for eventually paying off this debt through taxation must be identified, or the object of increasing national saving will not be achieved, as additional private saving will be offset by additional public dissaving. The redemption of the debt can be spread over a long period of time--but the longer the pay-off the slower the country will receive the benefits of increased national saving for productive investment. It has been estimated that the debt would be paid off in China by a payroll tax rate of about 1.5% for 100 years (Friedman, et al 1996) and in the U.S. by a consumption tax of 1% for 70 years (Gramlich 1996).

10. Educate the public so that they understand why change is both necessary and desirable, for them and for the economy as a whole. Chile was the role model in this respect, as the minister responsible for the reform carried on an extensive public relations campaign.

The danger for the Latin countries, especially those that plan to keep their old systems operating for many years, is that the reform on paper will not become a reform in practice, because of their desire to limit the transitional financing gap by slowing down entry to the new system. Workers continue to

accumulate credits under the old system, which may not be actuarially sound, and administrative costs mount as two systems are run simultaneously.

Closely related to the financing gap is the political opposition to reform that stemmed from entrenched interests in large public pillars in some of the Latin countries. Bureaucrats and unions that helped to run the old system did not want to phase it out. Maintaining large parts of their old system served to palliate opponents of pension reform and therefore facilitated passage of reform legislation. But it also means that the benefits of a full reform are not received. A fuller description of these problems and solutions in the Latin American countries can be found in Valdes-Prieto 1997. This model is also under active consideration in Hungary and Poland, and is one of three options proposed by the Social Security Advisory Committee in the United States--but has not yet been adopted outside the Latin region.

**The partial European model: notional DC plans or voluntary funded plans.**  
In fact, countries with large public pillars and implicit pension debts, such as those in Eastern and Western Europe, are finding it exceedingly difficult to make the transition to a partially funded system with a mandatory private pillar--in part because of the financing problem but also because of the political interests associated with existing institutions. This explains the third group of reforming countries--the "partial" European reformers, that feature notional defined contribution plans or large tax incentives for voluntary funded plans.

The notional account system was pioneered by Sweden, although the recently elected government has suspended adoption. It was passed but implementation has been stalled in Italy. In both cases, a large notional pillar is supplemented by a small (2%) funded pillar. The system was also adopted and is now being implemented by Latvia, which hopes to save enough money from reducing evasion and early retirement to start a substantial funded pillar as its next step. Outside of Europe, China has a notional defined contribution system, de facto. While in principle China wants to start a second pillar made up of funded individual accounts, it has been unable thus far to finance the transition, so the individual accounts that have been set up in many cities remain largely notional.

A notional defined contribution plan is one in which the worker has an individual account that is credited with his contributions plus interest. However, the accumulation is notional rather than actual, since the money paid in by workers is immediately paid out to pensioners rather than being invested; i.e. the system remains PAYG. This system captures some of the advantages described above of linking benefits actuarially to contributions within each cohort (especially the reduction in intra-cohort inequities and early retirement).

However, it does not capture the benefits of funding, since there are no funds. That is, intergenerational transfers remain and saving is not augmented. In addition, as populations age, either the contribution rate would have to increase or the benefits and notional rate of return would have to decrease for newer cohorts, to keep the system solvent in the absence of investment income. In either case, incentives for evasion would be strong, stemming from a high contribution rate and/or a notional rate of return that is less than the real market return. Nevertheless, the notional defined contribution system is attractive to countries that have very large implicit pension debts, especially those that are unwilling to incur an explicit fiscal deficit to pay off these obligations and those that, for political reasons, do not want to develop new institutions tied to privately managed funds.

Finally, as another example of a partial structural reform, the Czech Republic has instituted large tax incentives to encourage workers to start their own funded DC retirement plans on a voluntary basis. Other countries are also considering this approach. However, international experience indicates that, unless pressed through collective bargaining by powerful unions, voluntarism will cost the government lost tax revenues but the retirement accounts are likely to remain small and coverage very incomplete.

Thus, many countries around the world are seeking to diversify their sources of retirement income away from pure reliance on publicly managed PAYG DB systems, and some are succeeding, but those with large pension debts are having a hard time managing the transition to a substantial funded pillar. The major

lesson for developing countries--avoid going down the PAYG road, because it is very difficult to reverse later on.

#### **IV. Growth Effects of Old Age Systems: How Large Are They?**

The chief theoretical argument for the recommended multi-pillar system is that it will have a positive effect on efficiency and growth, because the old system introduced or failed to remove distortions that will be eliminated by the reforms. A secondary argument is that it will enhance the financial sustainability of the old age system and thereby provide better protection for the old in the long run.

Growth effects are notoriously difficult to quantify and prove, in part because relatively little experience and data are available and in part because, even if we had the data, it would be difficult to build models that capture all the complex dynamic interactions; that is, it is difficult to specify the counter-factual. Pension reform has several different potential growth effects; usually studies focus on one of these while ignoring or holding the others constant. For example, general equilibrium models that analyze labor supply effects typically assume away direct increases in saving, and vice versa. In this section I summarize the limited research that has been done on these topics, concentrating on the simulated growth effects in countries that have been considering structural reforms and econometric estimation of the actual effects in the few countries that already have a track record. The papers at this conference advance this research agenda further. This section also outlines the many unmeasured effects that remain to be investigated.

While measuring growth effects of pension reform is problematic, the available evidence indicates that they are positive, possibly large, and probably the financial sustainability of the system has also improved.

**Reduced labor market distortions, evasion, escape to the informal sector.** One problem in PAYG DB systems is the possibility that the high payroll tax will lead to labor market distortions. In projections for the U.S., Feldstein and

Samwick (1996) estimate that, in steady state, a fully funded DC system would reduce the deadweight loss from the payroll tax (stemming from distorted decisions about labor force participation, hours worked, choice of job and location, degree of effort, form of compensation, etc.) by 2.5% of covered wages or 1% of GNP annually. After taking into account transition costs, the long run reduction in deadweight loss is 1.6% of covered wages or .6% of GNP annually. This may be compared with a projected exogenous annual growth rate in real wages of 1% per year.

The large size of the efficiency gain stems from the fact that capital accumulation and investment income in the funded DC pillar reduces the required payroll tax rate by 10.4 percentage points and this payroll tax came on top of an already high income tax; thus the estimated labor market distortions from the present system are substantial. F&S assume a relatively low target benefit rate which reduces the efficiency loss under the old system but they also assume a full shift to funding, rather than a partial shift as in a multi-pillar system, which increases the share of this loss that is eliminated under the new system.

In a separate study of the U.S. situation, using different assumptions, Kotlikoff finds a 4% gain in potential consumption for all generations if a system that features a low benefit-tax linkage is replaced by one with a high linkage and the transition is financed by a consumption tax (Kotlikoff 1996). The difference between Kotlikoff's and F&S numbers, demonstrates the sensitivity of these results to key assumptions. Kotlikoff does not assume investment income that reduces the total required tax rate nor does he assume that national saving has increased, but simply assumes that at the margin the labor tax is reduced so the efficiency of labor supply decisions improves. The gain disappears if a distortionary income tax is used to finance the transition.

Are these numbers from the U.S. applicable to developing countries? Developing countries that do not have large on-going social security systems could move directly to the steady state without incurring transition costs, so if they are considering establishing a PAYG DB system versus a fully funded DC system, the larger deadweight loss saving (2.5% in F&S) would be applicable. But

many developing countries do not have effective income tax rates, implying a smaller deadweight saving. And of course, the labor supply elasticities and rates of return to capital might be different in developing countries. Most important is the differential likelihood of evasion and escape to the informal sector.

In developing countries the potential rate of evasion is high, leading to a system dependency rate that far exceeds the demographic rate, a higher required contribution rate, and a misallocation of labor to the informal sector, where productivity is lower. The existence of the informal sector increases the probability that high taxes will be evaded by changing labor allocation decisions. Simulations of hypothetical economies show that a 15% payroll tax may induce a shift of 30% of the labor force to the informal sector, reducing GNP growth by 1% annually (Corsetti 1994; Corsetti and Schmidt-Hebbel 1997).

In Averting we argued that funded DC plans are less likely to be evaded by escape to the informal sector because they closely link benefits to contributions. While this seems reasonable, we cannot be sure that this will happen in the real world. For example, myopic workers may continue to evade contributions because they will not be able to access their mandatory savings for many years. In periods when investment returns are low, workers may be especially tempted to evade, preferring to consume or to invest in education, housing or consumer durables. If the payroll tax for pensions is only a small part of the total payroll tax, the incentive to escape to the informal sector may remain strong. Also, access to a minimum pension guarantee in the first pillar may lead workers to take a job where they need not report their income once they qualify for the guarantee. Indeed, preliminary evidence from Argentina and Chile suggests that evasion has not gone down much since the new system was established (Valdes-Prieto 1997). However, it is difficult to be conclusive about this, because it is difficult to separate evasion from normal labor force withdrawals.

If escape to the informal sector occurs in a funded DC plan it does not have the same negative effects on system sustainability that it does in a PAYG DB plan, since the costs are simply borne by the evader in the form of lower benefits, rather than being passed on to others in the form of a higher



contribution rate. This is a big plus. Nevertheless, it still creates the same problem for labor allocation and productivity and an even greater problem for the financial security of the evading workers who may not have an adequate pension and may become a charge on the public treasury when they grow old. So we need to watch the data on evasion carefully, and countries need to continue to modernize their information and tax collecting systems, as a part of the reform.

On balance, it seems that the shift to a partially funded multi-pillar system is likely to reduce labor market distortions in developing countries much less than F&S's estimates, but even if the efficiency gain were only 25% as high (.6% of covered wages per year), this would still be large relative to other instruments that the government could use to achieve the same goal.

**Augmented retirement age.** A second source of inefficiency in PAYG defined benefit systems is that, in the short run and during periods of unemployment they tempt politicians to promise workers an early retirement age with generous benefits, and this is difficult to reverse in the long run. Workers may prefer an extra year's wage to an extra year of leisure, but the high contribution rate that does not yield commensurate benefits and the high pension that is paid for by others may lead them to retire. We expect that fully funded DC plans will mitigate this effect, because if the worker retires early the costs are internalized--her own pension is reduced. Thus she has an incentive to continue working to raise her lifetime income. This in turn will increase the supply of experienced labor in the economy and will improve welfare. For example, suppose that the reform eventually leads workers to raise their own retirement age by 4 years, and that leisure is worth, on average, half their productivity and wage during that period. Then, the supply of labor and GNP (assuming constant marginal productivity of labor) are both raised almost 10% and welfare is raised about 5%.

Again this seems reasonable, but we do not know for sure that it will happen. Perhaps the new system will be so cost-effective in other ways that workers will spend some of their increased income on leisure, taken in the form of early retirement. This still increases welfare but it may not increase GNP. The impact on growth remains to be tested empirically. But the impact on system

sustainability must be positive, since those workers who continue to retire early pay the price in the form of a reduced pension, rather than becoming a drain on the finances of the pool.

**Increased long term national saving.** A major rationale for pension reform that emphasizes fully funded plans is that it will increase long term national saving. When a country without a prior PAYG system institutes a multi-pillar system, consumption will decrease and saving will increase if the mandatory saving rate exceeds the voluntary rate. When a country with an existing PAYG system replaces it with a multi-pillar system, national saving increases if benefits are cut or taxes are increased, usually to cover transition costs. In both cases, putting part of the contribution into the worker's own mandatory saving account may be a more politically acceptable and less economically distortionary way of achieving this goal than requiring a high tax rate that goes into the general treasury. Furthermore, in both cases the recommended multi-pillar system reduces the probability that governments will have to borrow to cover escalating pension costs as populations age. And if the new system increases growth because of its labor market effects, some the growth will feed back into saving. These savings then become a further source of growth--empirically we observe that most savings stay in the country of origin and most of a country's productive investment comes from its own saving, despite the global capital markets that supposedly prevail. The increase in saving and GNP growth is welfare-enhancing (or Pareto-optimal) if the initial saving rate was sub-optimal due to public or private myopic or to a tax-wedge between private and social returns to investment.

But again, there are reasons why this increased saving might not materialize. For example, mandatory saving may not increase total private saving if individuals find ways to offset them against other voluntary saving or accumulated assets. With perfect capital markets, private saving will not increase at all, since people will simply borrow against their mandatory pension saving. A positive saving effect ultimately depends on the assumption that voluntary long term saving and assets are small and borrowing opportunities

limited for substantial groups within the population. The limited borrowing condition probably holds for most developing countries. Simulations of a representative economy indicate that a tax-financed transition to a fully funded system in the presence of credit constraints will increase output by 22% and welfare by 16% (Cifuentes and Valdes-Prieto 1997).

It is also possible that public dissaving will increase if the build-up of pension reserves make it easier for governments to run larger deficits. This is particularly likely to be the case for countries that have a large implicit pension debt that must somehow be covered to make the pension transition. If the transition is fully financed by borrowing, even in the long run, government dissaving will offset private saving, and the expected increase in national saving will simply not transpire. On the other hand, if it is financed through taxes or cutbacks in other government expenditures, public saving increases national saving further (but the tax hikes may have a distortionary effect on labor markets, as noted above).

What does the empirical evidence show? Referring first to the study by F&S discussed above, they attribute the 10.4% drop in the required contribution rate and the consequent reduction in deadweight loss to increased pension saving and the investment returns on this saving. Initially the payroll tax increases by about 1% to help build up the individual accounts while holding total benefits constant. In the long run the payroll tax falls by 10.4%, to 2%, while holding benefits constant. This is possible because the accumulated tax increments in the early years, plus the accumulated interest, increases the capital stock enough to generate as much retirement income as would a 10.4% payroll tax--4.2% of GNP--while still maintaining the new higher level of capital stock. Thus the young consume less at first, but consume more later on because the GNP pie has grown.

In F&S, the capital stock grows rapidly and substantially because they assume a high real 9% rate of return, which reflects their estimation of the full marginal productivity of capital before the corporate income tax is paid. This is a higher long run return than most analysts would use. (Although it is unlikely that pension funds will earn 9% in the long run, it is well to remember

that private returns may be less than social returns due to taxes, and these augmented tax revenues should somehow be included in welfare calculations of pension reform). Also, they seem to assume that voluntary saving will not be cut back as the funded accounts grow and give increased credibility to their expected future pension benefits.

Other studies have assumed partial crowd-out. In planning its mandatory occupation scheme, Australia assumed 50% crowd-out and higher for workers who already were covered by voluntary occupational plans. This implied that, in the long run, national saving would be increased by 1.5% of GDP, thereby almost doubling the current net national saving rate which is 2.2% of GDP. (The gross national saving rate is about 15% of GDP). Australia, of course, had the advantage that the government did not have to borrow to pay off a pension debt since the second pillar was an add-on rather than a diversion of previous contributions. Although initially the tax-deductibility of contributions was projected to cause some government dissaving, in the long run the decreased burden on the means-tested public pension is expected to reduce government dissaving. One of the main effects of the reform may be to shift the allocation of private saving away from home ownership, which is now the predominant form because of tax inducements, and toward other more productive forms. However, these simulations, like those mentioned below, are highly sensitive to assumptions about future rates of interest, wage growth and coverage, as well as the degree of crowd-out (Bateman and Piggott 1997).

In his simulations for Mexico, Ayala (1996) assumes a 30-40% rate of crowd-out. If the transition is tax-financed or if it is debt-financed and Ricardian equivalence holds (so that private saving goes up to offset public dissaving), total saving goes up .4%-2.1% of GDP per year, compared with current gross national saving of about 14% of GDP. But if the transition is debt-financed and Ricardian equivalence does not hold, the impact on total saving is much smaller, even negative in some years, although positive over-all during the next 30 years. As in Kotlikoff's work, this underscores the importance of using taxation, and choosing the right tax, to pay off the pension debt. Projections for the

Philippines by Valdes-Prieto (1996) indicate a move to full funding would yield a long run increase in labor productivity and output of 1-4%, depending on assumptions, due to increased capital formation; the supply of labor and labor allocation are held constant in his model.

The only two countries that have had a mandatory saving plan long enough for saving effects to be estimated are Switzerland and Chile. In Switzerland the national saving rate rose from 6 to 8.5% of GDP in the decade after the funded second pillar became mandatory and the entire increase occurred in pension funds and related institutions such as insurance companies (Hepp 1997).

Regressions by Corsetti and Schmidt-Hebbel (1997) attribute half of the 21 percentage point decline in the private consumption ratio 1971-92 to the growth of Chile's funded pension plans and related developments such as capital market deepening. According to regression analyses by Haindl Rondonelli (1996), pension reform played a major role in increasing the national saving rate in Chile from 16.7% of GDP pre-reform (1976-80) to 26.6% post-reform (1990-94). Specifically, pension saving accounts for two-thirds of the increase--6.6 out of 9.9 percentage points--even after taking account of crowd-out, which is estimated to be small, largely because of borrowing constraints. A more modest positive effect on private saving, 4% of GNP by 1994, was found by Agosin, Crespi and Letelier (1996); voluntary saving apparently did not decline as mandatory saving increased because households had little voluntary saving to begin with. A significant positive effect of the pension reform on national saving was also found by Morande (1996). But the growth of consumer credit, possibly as the result of the pension reform, could increase consumer dissaving and offset some of these gains in the future (Holzmann 1996).

While some analyses focus on enhanced private saving, other studies emphasize the impact of pension reform on public saving and dissaving. Chile had to finance a pension transition, in part through deficit finance--which decreased national saving. The fiscal costs of the transition largely cancelled out the positive effect on private saving initially (Agosin et al 1996). However, these fiscal costs are short run while the increased private saving may persist in the

long run. In addition, Chile accumulated a large budgetary surplus ex ante in preparation for the reform, thereby reducing its need for deficit finance. And it continued to exercise fiscal discipline in other areas after the reform, possibly to facilitate the pension transition. By the early 1990's the government budget was running a surplus. While we do not know how large this surplus would have been otherwise, to the degree that the pension reform was financed by cutting public consumption, its positive effect on national saving is reinforced.

Given the high correlation between pension saving and other aspects of economic change, the controversy surrounding the determinants of private saving (e.g. which variables are endogenous?), and the even greater uncertainty about the determinants of public saving and dissaving (e.g. what is the counterfactual?), these econometric results must be very sensitive to model specification and the topic clearly requires additional research. Nevertheless, preliminary evidence indicates that pension reform can have beneficial effect on long term national saving rates--increasing them by 10 to 30% of the ex ante gross rates and sometimes over 50% of the ex ante net rates--providing it is accompanied by a broader set of policies designed to constrain consumer and government borrowing, including borrowing associated with transition costs.

**Financial market development.** One reason for favoring private management of pension funds is that this will develop a set of financial institutions--investment managers, insurance companies, and banks--that are essential for economic development. On the one hand, a funded pillar cannot get started without some minimum financial market capacity, but on the other hand, the funded pillar, if competitively managed and well-regulated, can be instrumental in enabling the financial market to grow in safety, size, depth and complexity. In developing countries, where private saving is already high, one of the main effects of a funded pillar may be to shift these savings out of land and jewelry and into financial market investments that are better for the broader economy, because of the development of these financial institutions.

Even in Australia it is expected that the financial market will grow as a result of the mandatory second pillar. For example, as noted earlier, some

private saving may be redirected out of owner-occupied housing into the financial markets. Insurance companies are expanding, developing a new line of products, including annuity products, to meet the anticipated demand stemming from pension funds (Bateman and Piggott 1997). In Switzerland also, growth of the life insurance industry, investment companies and mutual funds, have been spurred by mandatory funded pension plans. And corporate governance has been gradually changing, as institutional investors have demanded disclosure and better performance (Hepp 1997).

But the strongest evidence for this expected growth effect comes from Chile. During the five years preceding the adoption of its new system, Chile prepared the groundwork by organizing a primary market for treasury bonds, reforming its laws governing mutual funds, corporations and securities, privatizing banks, authorizing a price-indexed mortgage bond market and liberalizing the provision of insurance and reinsurance (Valdes-Prieto 1997). After the new system was introduced, this process continued--financial markets became more liquid as the number of traded shares on the stock market and their turnover increased; demand was created for the equities of newly privatized state enterprises; information disclosure and credit-rating institutions developed; the variety of financial instruments including indexed annuities, mortgage and corporate bonds grew; and asset pricing improved. Econometric analysis shows that financial market deepening induced by the reformed pension system (and other factors with which this was closely correlated) increased total factor productivity 1% per year, or half of the increase in total factor productivity, in Chile (Holzmann 1996).

**Two issues for further research: 1. Mandatory personal saving plans versus mandatory occupational plans.** The growth impact of saving depends in part on how productively it is invested. As discussed above, the big advantage of private over public investment is the likelihood that private management will produce a better allocation of capital. The evidence indicates that private management is indeed able to choose a more diversified portfolio with higher returns, although ubiquitous constraints on international investments constrain this somewhat.

Two basic models for decentralizing investment decisions in the second pillar have emerged--personal saving plans, where workers choose the investment manager (as in the Latin American model), and occupational plans, where employers and/or union representatives, make the choice (as in the OECD model). Which produces a better allocation of capital, higher investment returns, and lower administrative costs? This needs further research.

On the one hand, preliminary evidence from Chile indicates that workers are ill-informed, do not make decisions based on investment returns, that pension funds incur high marketing costs to lure them, and that regulations designed to safeguard the workers lead to inefficient investment strategies, such as herding behavior. On the other hand, the Chilean AFP's have earned an average real return of over 12% gross, and over 9% net of costs, since the inception of the new system, which compares favorably with returns over this period in most other countries (check these numbers).

On a priori grounds we might expect that occupational plans would have the advantages of economies of scale in decision-making, greater financial expertise of the decision-makers, and lower regulatory and marketing costs. However, occupation plans open the door to financial abuse and more general principal-agent problems, as employers or union representatives make the investment decision while workers bear the risk. Employers might choose investment managers or strategies that benefit them, at the cost of lower returns to their workers. For example, in Switzerland employers tend to choose banks with which they have had long-standing financial relationships, in a relatively non-competitive environment (Hepp 1997). A separation of decision-making from risk-bearing may lead to outcomes that are off the risk-return efficiency frontier. An extreme case of employer misallocation is exemplified by the Maxwell scandal and an extreme case of worker misinformation by the insurance company misrepresentations that led workers to purchase financially disastrous policies, both of these in the U.K. (Johnson 1997).

In situations where workers are mobile or move in and out of the labor force, an occupational plan may leave them with many small costly accounts,



plans, while a personal saving plan would automatically be carried with them regardless of their current employer. This is a problem in Australia, which has a mandatory occupational scheme, and potentially in Hong Kong, which is considering this system. These high administrative costs reduce the resources available for productive investment and consumption. We could certainly benefit from careful empirical studies in this under-researched area.

**2. Financial market response to the trade-off between implicit and explicit debt.** As discussed above, when a country makes a pension transition it trades off part of its implicit debt for explicit debt. This in itself can have an impact on economic growth because of the response of financial markets--a topic that requires further research. If the implicit debt were legally binding and known to all, a transition that converts an implicit debt to an explicit debt by conversion into government bonds should have virtually no financial market effect. However, the implicit debt is by its nature more ambiguous, with greater uncertainty about how much will eventually repaid. In some countries (e.g. Argentina) courts have upheld implicit public pension promises as a legally enforceable property right, but in other countries (e.g. the U.S.) they have not done so and even in Argentina the government has not yet paid the court-determined amounts. Moreover, until recently most people, including most financial analysts, were not even aware of the basic magnitude of the implicit debt in most countries.

Given this situation, it is possible that the financial markets will have a negative reaction when the explicit debt goes up, even if offset by a decline in the implicit debt, and this in turn could have a negative impact on economic growth. The debt becomes more codified, and its large size a matter of public information. Interest rates could rise in response, and this would have a chilling effect on productive investment. Interest rates could also rise if creditors are mainly concerned about the default risk associated with bonds and believe that in the past bonds had priority over social security debt--then mixing the two together in the form of explicit debt would increase the risk premium.

On the other hand, countries could use the conversion as an opportunity to reduce the implicit debt--cutting the face value in return for greater certainty. And if creditors think that social security obligations are protected from default, eliminating the implicit pension debt gives them more protection. Further, financial markets could be reassured that the new system will prevent the debt from escalating further in the future. In these cases, interest rates might actually fall when implicit debt is swapped for explicit debt during the transition.

I do not know of any careful empirical study of this issue, but my impression is that the financial markets did not react negatively in the reforming Latin American countries.

**Summary.** In sum, a small but growing body of empirical evidence indicates that pension reform has produced positive growth effects. That is, the impact on saving, productivity, output and welfare may be high relative to exogenous sources of growth in these variables (see Table 2 for a summary).

Several caveats are essential in interpreting this evidence. First, because it is difficult to specify the counter-factual, these results are highly sensitive to the assumptions that are made, and each study typically contains a different set of assumptions. In particular, the econometric analyses for Chile are subject to omitted variable bias and the simulation results depend heavily on assumptions about crowd-out and rates of return. Second, they also depend heavily on key policy decisions, such as the question of how high the required contribution rate and target benefit rate will be, what proportion of the multi-pillar system should be funded and DC, and how the transition will be financed. While debt finance may be necessary for political purposes some degree of tax finance is necessary to meet the economic objectives, and of course some taxes have better efficiency properties than others. Third, it is important to remember that, even if it claims to use a general equilibrium model, each study typically deals with only one possible source of growth, so that many of these results are additive--that is, the total growth effect is the sum of the separate effects on labor market distortions, early retirement, escape to the informal sector,

capital accumulation, financial market development and other sources of growth. So if each separate effect increases GDP in amounts ranging from 1-10%, their sum may increase GDP 10-30%.

Finally, in situations where we do not have evidence that reform has enhanced growth, as with respect to evasion and early retirement, it appears likely that it has enhanced the financial sustainability of the pension system, as the funded DC pillar expressly requires individuals to internalize these costs rather than passing them on to others.

## V. Conclusion

Averting the Old Age Crisis argued that old age security systems with a large funded defined contribution component, decentralized competitive management of these funds, and a social safety net, are most likely to promote economic growth, provide acceptable income to the old, including the old with low lifetime incomes, and reduce risk by diversification. These recommendations were based on an analysis of the problems observed in pay-as-you-go defined benefit systems and publicly managed funded systems, as well as our expectations, based on economic theory, about how the proposed new system would work. We also drew on the experience of the very limited number of countries that had already experimented with the proposed multi-pillar system.

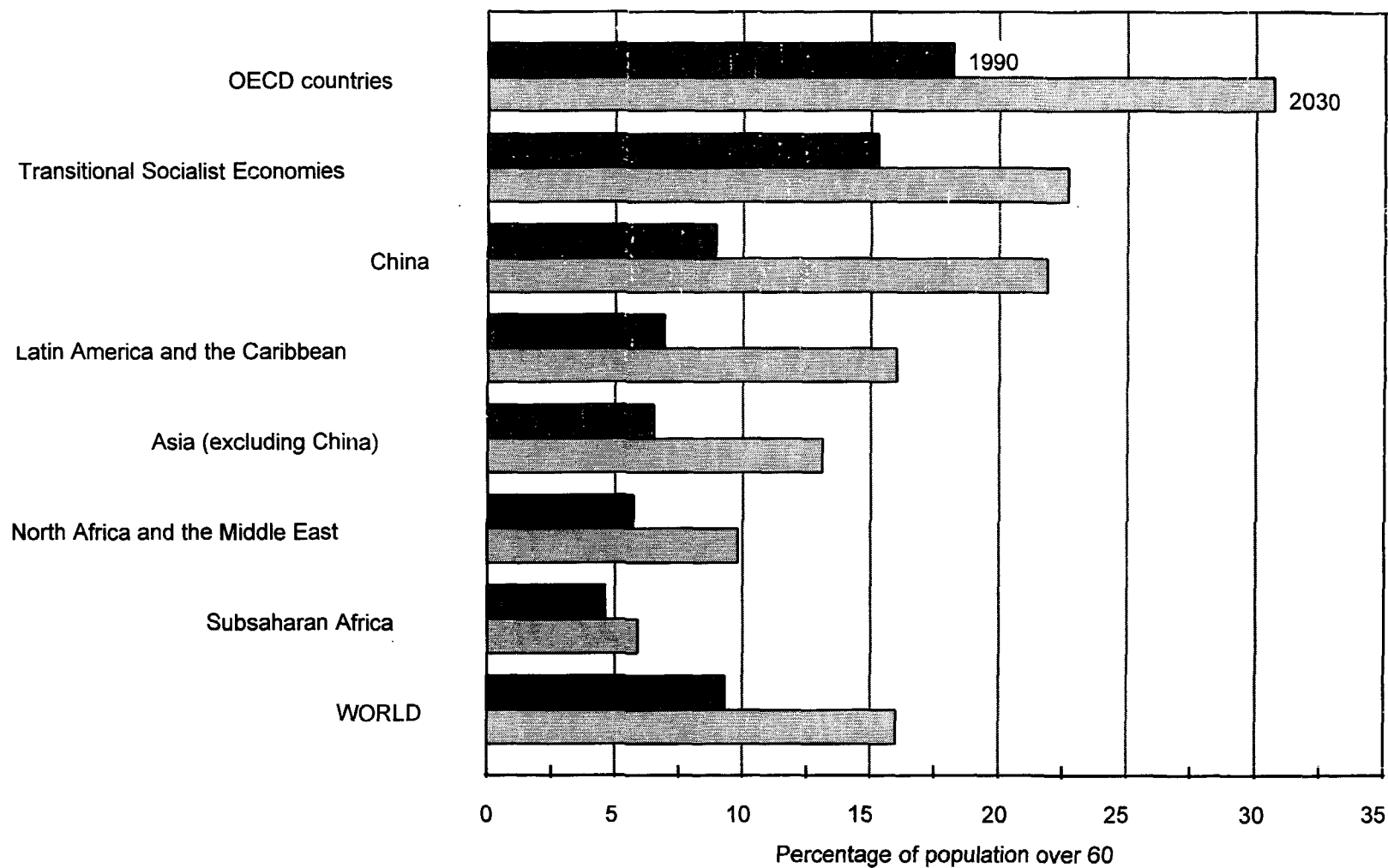
Since the publication of Averting, the move toward multi-pillar systems has accelerated around the world, spurred by the same demographic and economic forces that pushed us in that direction. With the aging of the world's population, it has become increasingly important to choose a reliable and cost-effective method of old-age support. With economic growth slowing down in many countries and financial markets opening up globally, it has become increasingly important to raise productivity through improved incentives in the labor market and through the accumulation of capital which is then allocated to its most efficient uses. Where income disparities have widened, it has become increasingly important to provide additional protection to low wage-earners who have grown old. A multi-

pillar system that includes a mandatory publicly managed tax-financed defined benefit pillar for redistribution, a mandatory privately managed funded defined contribution pillar to manage peoples' retirement savings, and a voluntary pillar, possibly tax-advantaged, for people who are willing to pay for more security, seems most likely to accomplish these objectives. Thus several Latin American and OECD countries have already adopted multi-pillar systems, and they are under serious consideration in Eastern Europe, East Asia and the U.S.

However, countries with a large implicit pension debt and with an accompanying set of traditional social security institutions are having trouble overcoming political opposition and financing the transition. Developing countries are fortunate in that they are at a relatively early stage and can choose a preferred multi-pillar system almost from the start, before these obstacles arise.

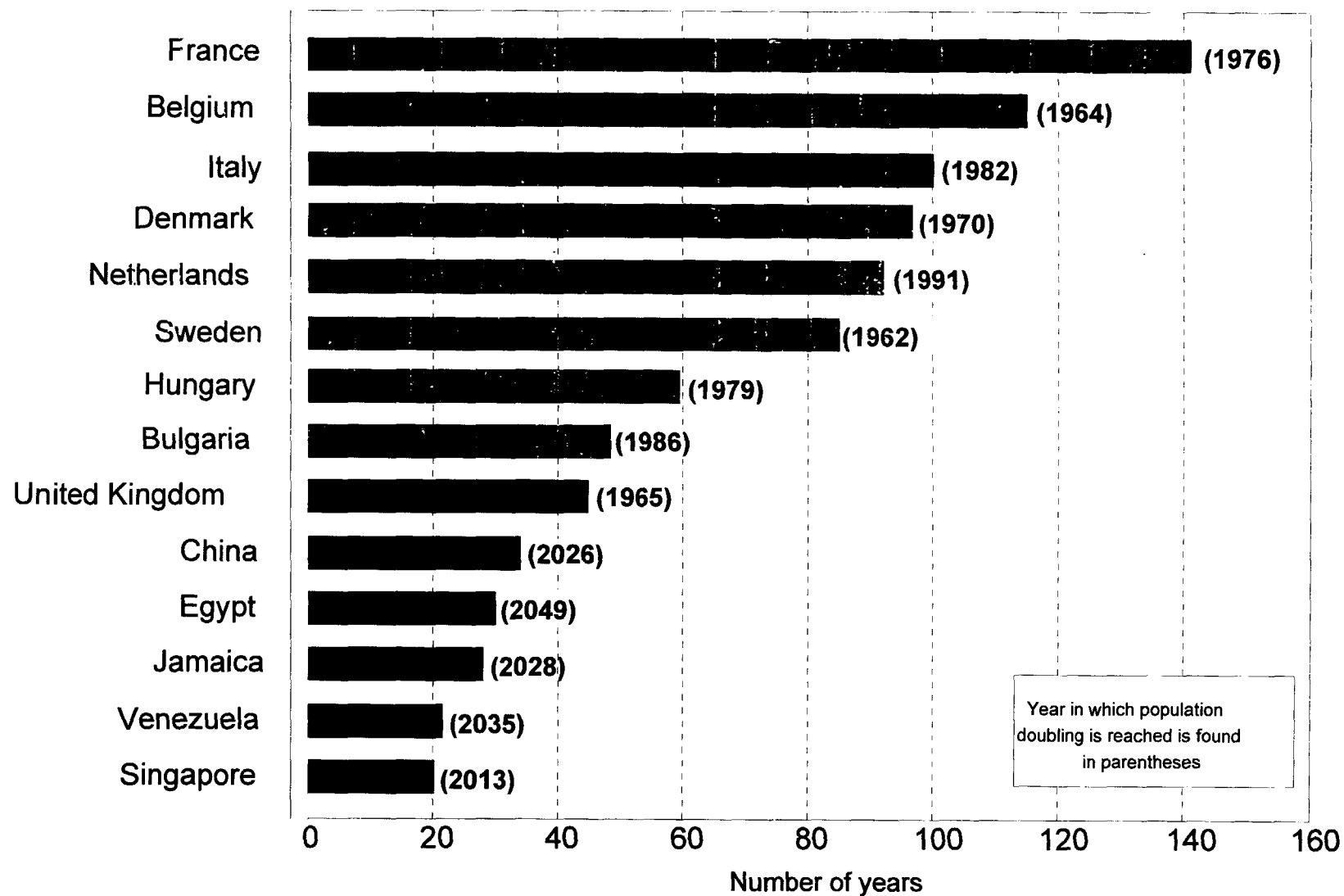
Also during the last two years new research has been carried out on some of the critical assumptions underlying the recommendations in Averting. In particular, the effects of a full or partial shift to a funded defined contribution plan on labor supply and its allocation, national saving and financial market development have begun to be quantified, both in simulated projections for countries that are or were investigating reform and in econometric or descriptive analyses for countries that already have reformed. Evidence from the United States, Australia, Switzerland, the U.K., Mexico, Argentina and Chile supports the existence of positive growth effects, sometimes in large quantities. While these empirical investigations are still at an early stage, it appears that countries that are concerned about growth should seriously consider using pension reform as a potentially powerful tool, to improve the well-being both of the old and the young.

Figure 1 Percentage of the Population Over 60 Years Old, by Region, 1990 and 2030\*



\*Unless otherwise noted, source for all figures is "Averting the Old Age Crisis"

Figure 2 Number of Years Required to Double the Share of the Population over 60 from 9 to 18 Percent, in Selected Countries



Source: European Historical Statistics, World Bank population data base projections.

**Figure 3 Coverage (Contributors / Labor Force)**  
**Relationship of the Income per Capita and Coverage**

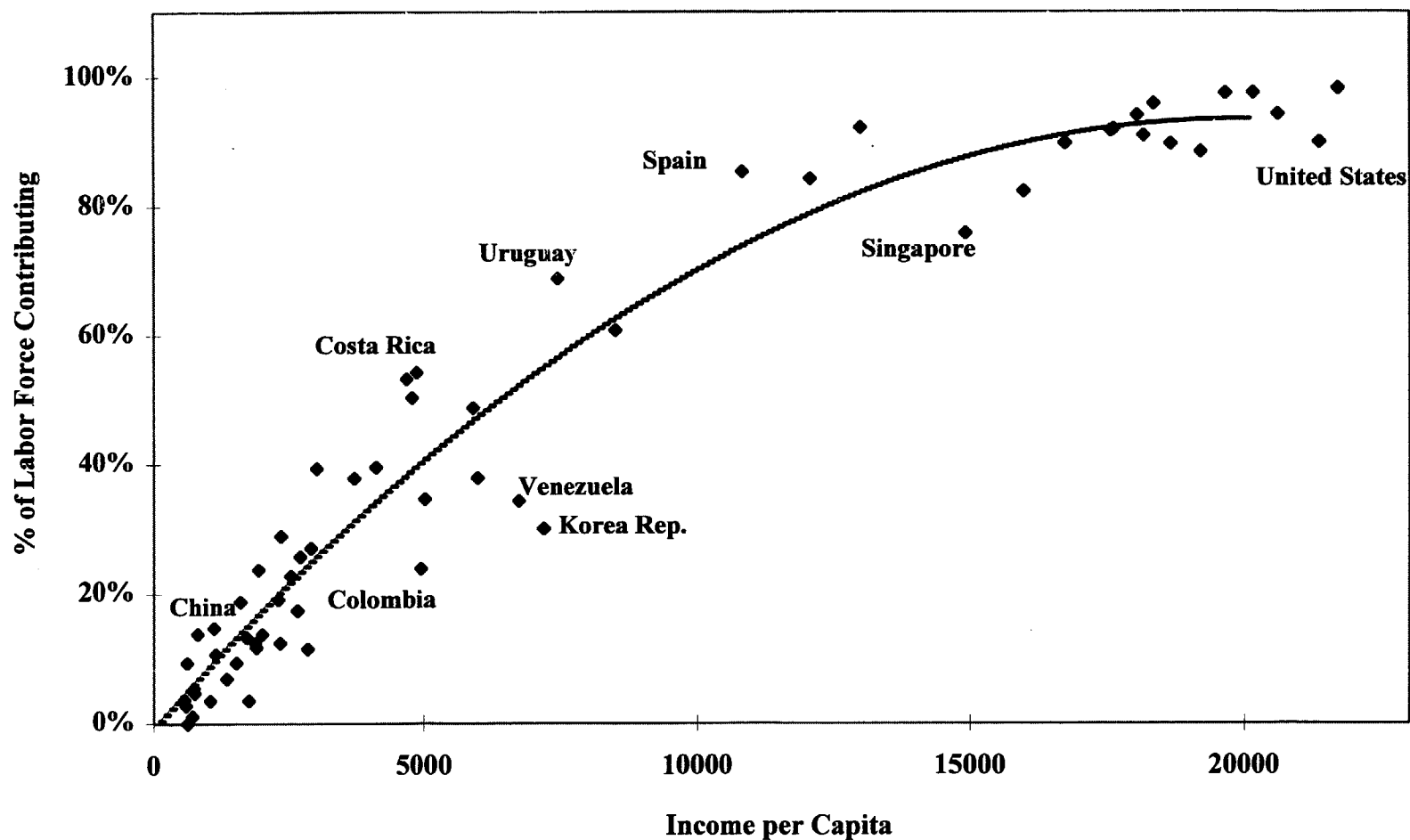
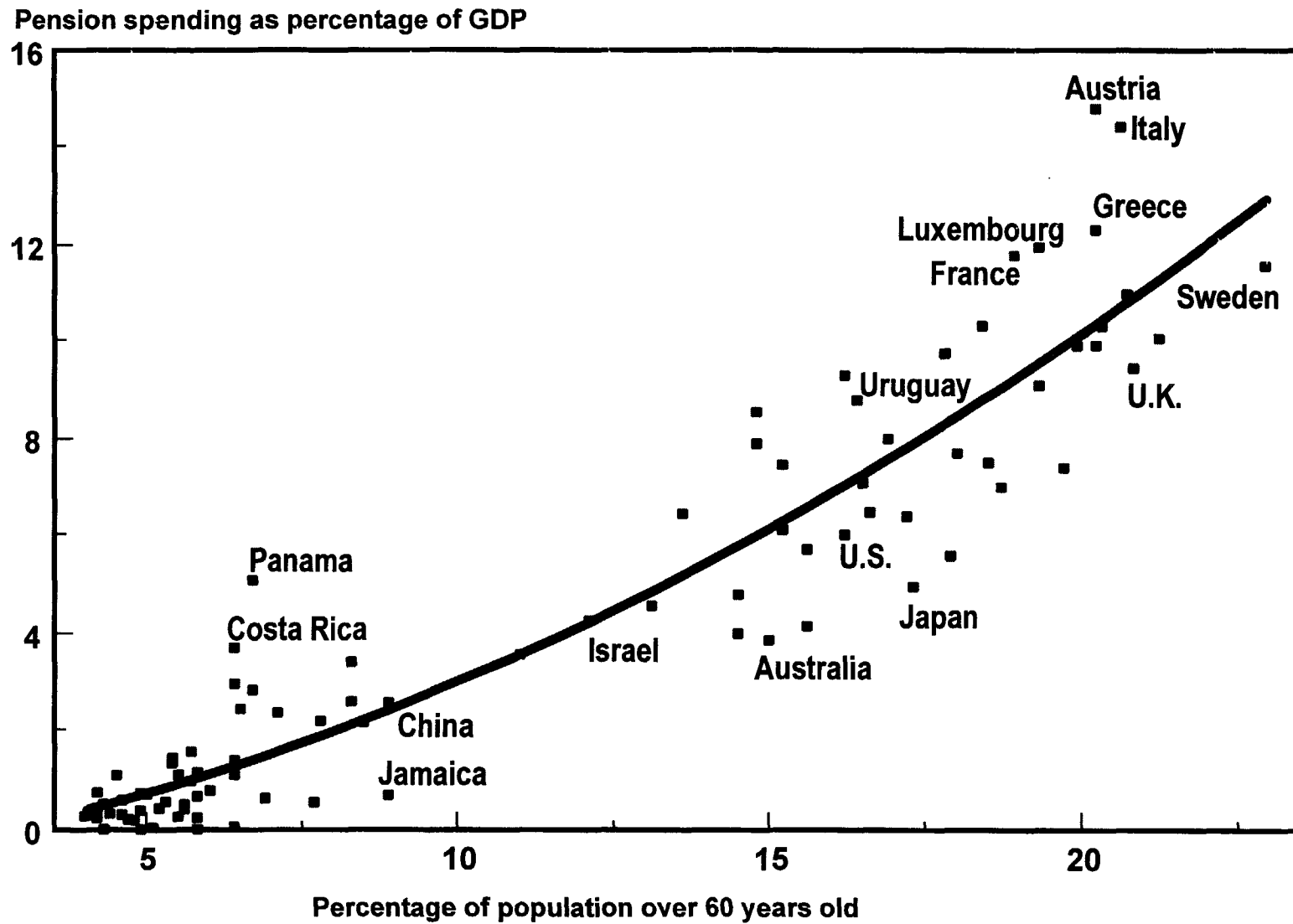
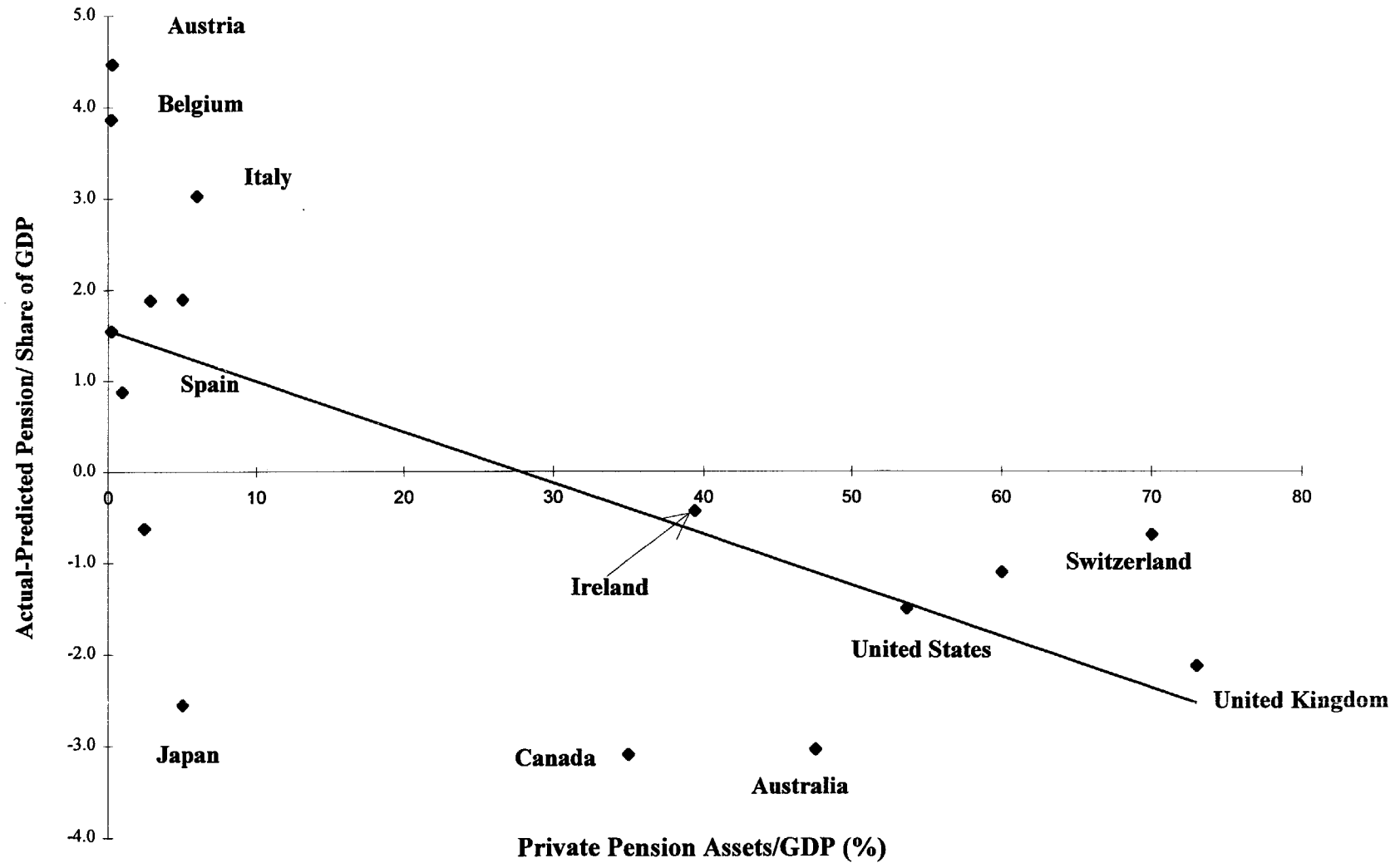


Figure 4 Relationship Between Percentage of the Population over 60 Years Old and Public Pension Spending



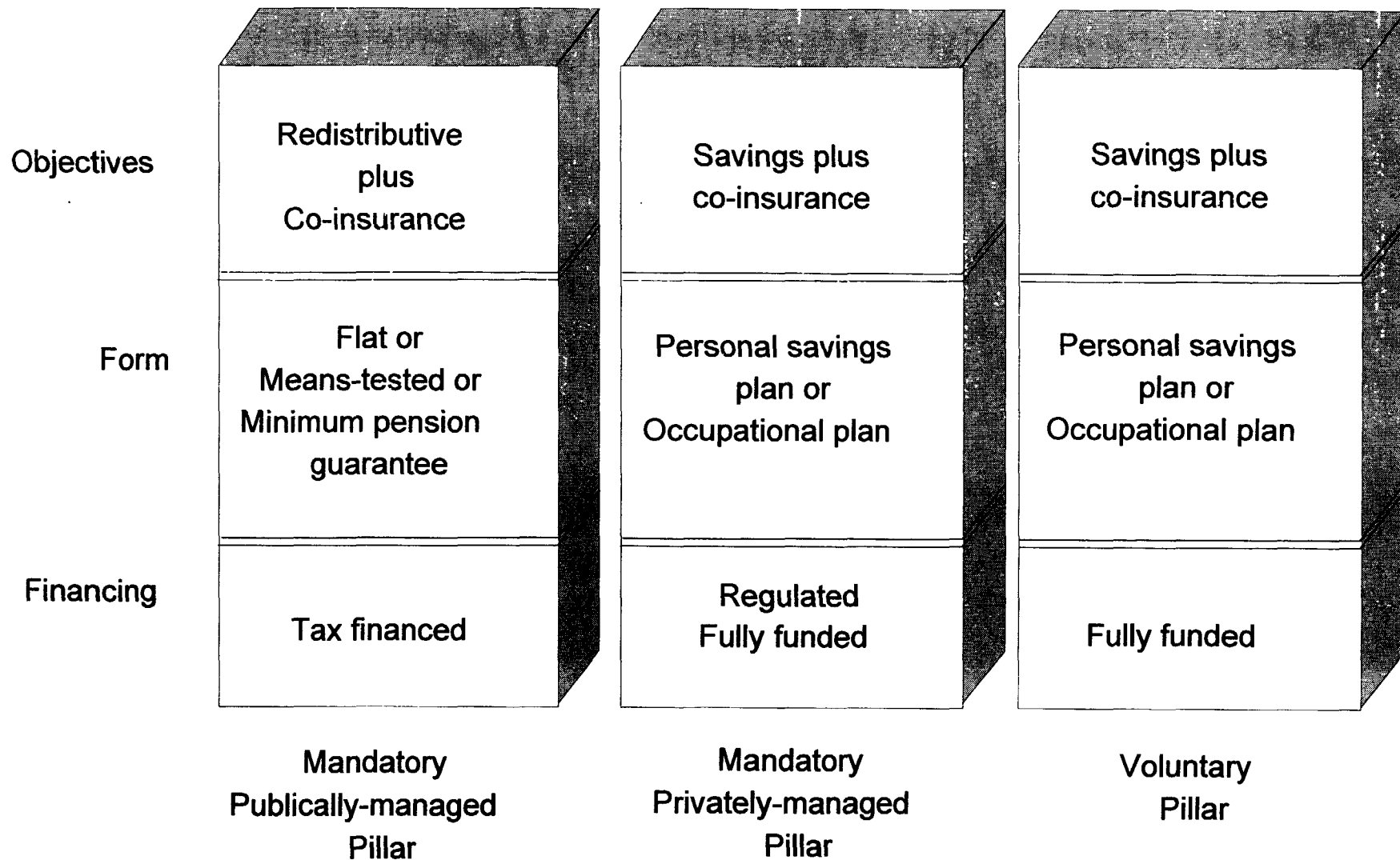


**Figure 5 Demographics Aside, Public Pension Spending is usually  
Lower in Countries with Big Private Pension Sectors...**

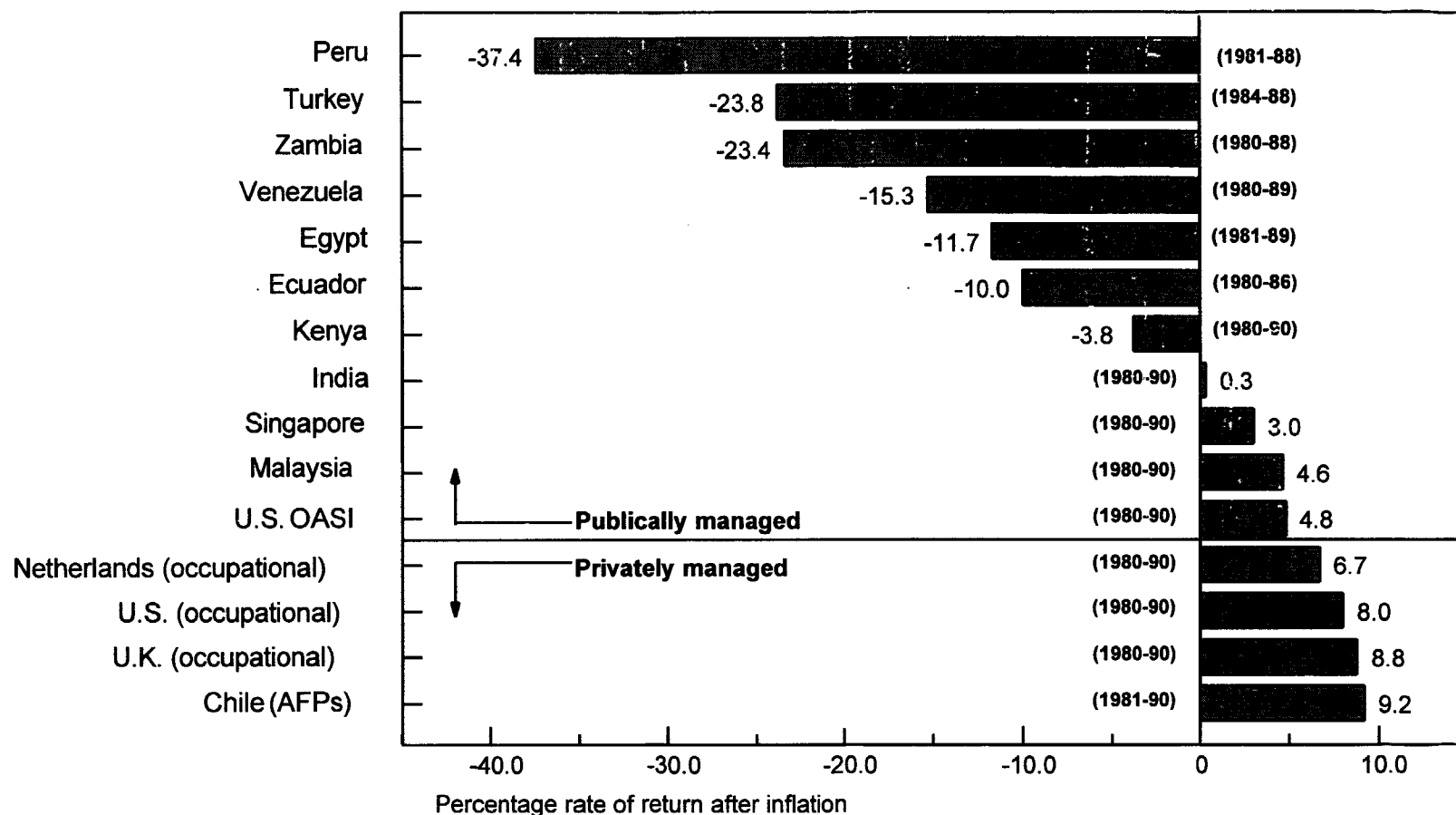


Source: Robert Palacios

Figure 6 The Pillars of Old Age Income Security



**Figure 7 Gross Average Annual Investment Returns for Selected Pension Funds, 1980s**



Note: Simple averages for countries with at least five years of data during the 1980s. Malaysia, Singapore, Kenya, India and Zambia are publically managed provident funds. Rates reported are returns credited to worker accounts. Peru, Turkey, Venezuela, Egypt, Ecuador and the U.S. are publically managed reserves of partially funded pension plans. Amounts reported are gross returns to the funds. In many cases data on administrative costs are not available. The Netherlands, U.S. and U.K. are privately managed occupational plans; estimated average net returns have been reported by subtracting one percentage point from simulated average gross returns. Actual average net returns, after all administrative expenses, are reported for the Chilean AFTs; average gross returns were 12.3 percent. For the Occupational plans and AFPs actual returns and expenses varied by fund.

Source: *Averting the Old Age Crisis*, p.95.

Figure 8 Implicit Public Pension Debt, 1990

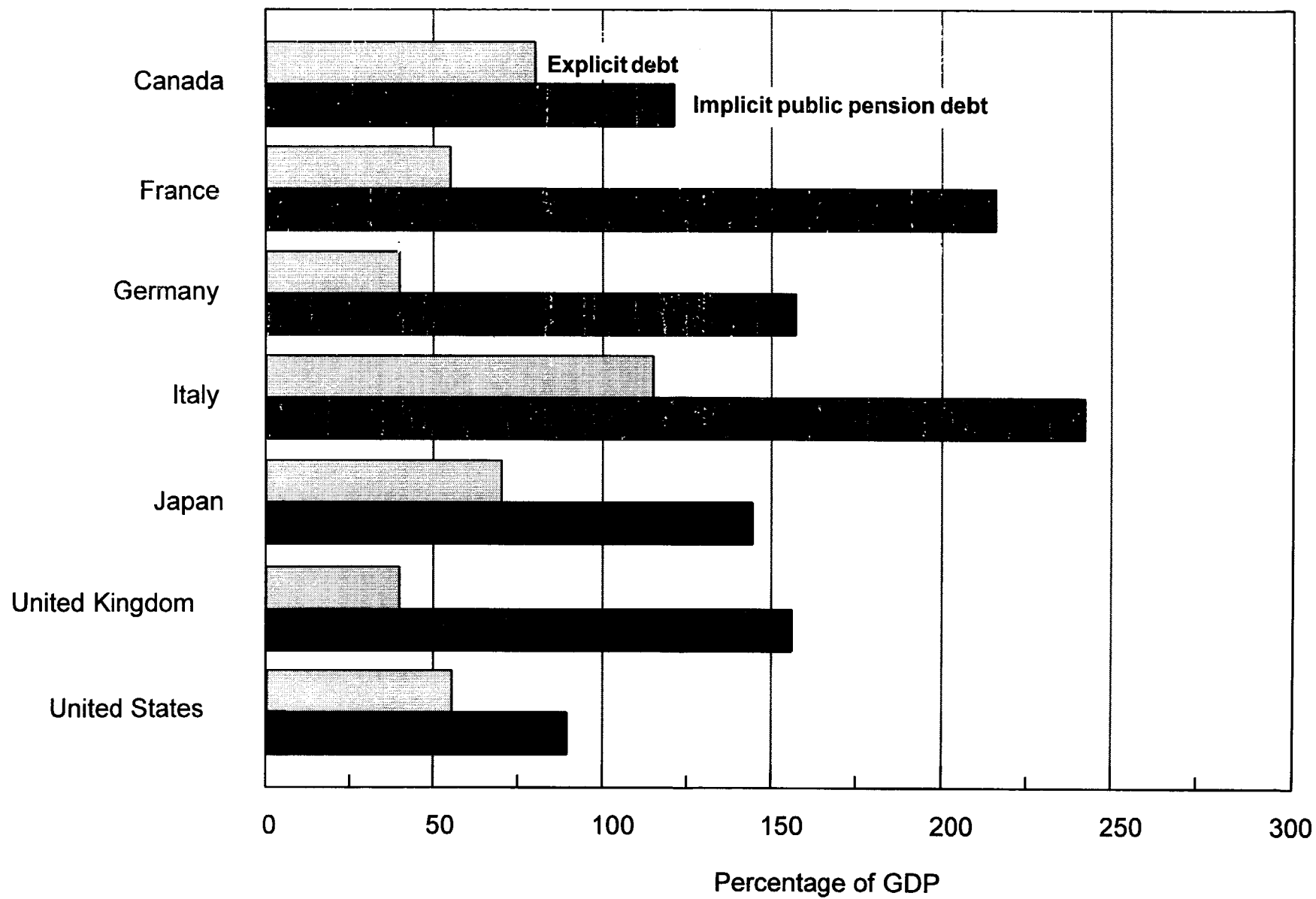


Table 1: Implicit Pension Debt During the Early 1990s

	IPD/GDP for 4% discount rate	% of population over 60 years old
Senegal	27	4.3
Mali	26	4.9
Burkina Faso	15	5.0
Venezuela	30	5.6
Peru	37	5.8
Cameroon	44	5.8
Congo	30	6.1
Brazil	187	6.7
Turkey	72	7.1
Albania	67	8.1
China	63	8.9
Uruguay	214	16.4
Croatia	350	17.8
Ukraine	141	18.7
Hungary	213	19.3

Source: p. 38. Finance and Development/June 1996

Robert Palacios for Albania

Cheikh Kane for Burkina Faso, Congo and Mali

Table 2: The Growth Impact of Pension Reform

Country	Author	Size	Comparison
<u>Increased output due to removal of labor market distortions</u>			
*U.S.	Feldstein	2.5% covered wages or 1% of GNP in steady state	projected exogenous real wage growth is 1% per year
*U.S.	Kotlikoff	4% gain in consumption or leisure for all generations	
<u>Increase in saving rate due to mandatory saving plan</u>			
*U.S.	Feldstein	saving increases 1% of covered wages or .4% of GDP. Annual output increases 4.1% of GDP in steady state	current national saving rate =
*Australia	Bateman & Piggott	1.5% of GDP in long run	current net national saving rate is 2.2% of GDP. Gross saving rate is 15% of GDP
*Mexico	Ayala	.4 - 2.1% of GDP	current gross national saving = 14% of GDP
**Switzerland	Hepp	2.5% of GDP increase in national saving rate after 10 years	saving was 6% of GDP before pension reform, 8.5% after
**Chile	Haindl Rondonelli	6.6% of GDP after 14 years	gross saving was 16.7% of GDP pre-reform, 26.6% post-reform
<u>Increased productivity due to financial market development after pension reform</u>			
**Chile	Holzmann	1% per year increase in total factor productivity	total increase in TFP was 2% per year after pension reform
* = projected before reform ** = actual, after reform			

## References

- Agosin, M. R., G. Crespi T., and L. Letelier S. 1996. "Explicaciones del Aumento del Ahorro en Chile," Centros de Investigacion Economica, Banco Interamericano de Desarrollo.
- Ayala, U. 1996. "The Savings Impact of the Mexican Pension Reform," World Bank.
- Bateman, H. and J. Piggott 1997. "Mandatory Occupational Pensions in Australia." Annals of Public and Cooperative Economics, forthcoming.
- Cifuentes R. and S. Valdes-Prieto 1997. "Transitions in the Presence of Credit Constraints," in The Economics of Pensions: Principles, Policies, and International Experience, ed. S. Valdes-Prieto. Cambridge: Cambridge University Press.
- Corsetti, G. 1994. "An Endogenous Growth Model of Social Security and the Size of the Informal Sector," Revista de Analisis Economico 9, 1, 57-76.
- Corsetti, G. and K. Schmidt-Hebbel 1997. "Pension Reform and Growth," in The Economics of Pensions: Principles, Policies, and International Experience, ed. S. Valdes-Prieto. Cambridge: Cambridge University Press.
- Feldstein, M. and A. Samwick 1996. "The Transition Path in Privatizing social Security," NEBR.
- Friedman, B., E. James, C. Kale & M. Caesar 1996. "How Will China Care for Its Aging Population?" World Bank PAD Discussion Paper.
- Gramlich, E. 1996. "Different Approaches for Dealing with Social Security," Journal of Economic Perspectives, 10, 3, 55-66.
- Haindl Rondanelli, E. 1996. "Chilean Pension Fund Reform and its Impact on Saving," Universidad Gabriela Mistral, Discussion paper.
- Hepp, S. 1997. "The Swiss Multi-Pillar System." Annals of Public and Cooperative Economics, forthcoming.
- Holzmann, R. 1996. "On Economic Usefulness and Fiscal Requirements of Moving from Unfunded to Funded Pensions," University of Saarland Working Paper.
- Johnson, P. 1997. "Pension Reform in the United Kingdom." Annals of Public and Cooperative Economics, forthcoming.
- Kotlikoff, L. 1996. "Privatizing Social Security At Home and Abroad". Discussion paper.
- Morande, F. 1996. "Savings in Chile: What Went Right?" Inter-American Bank Working Paper Series 322.a
- Pujol, T. 1996. "Some Considerations on Pay-As-You-Go vs. Fully-Funded Schemes," World Bank.
- Valdes-Prieto, S. 1996. "The Philippines: Macroeconomic and Fiscal Impact of Old Age Systems" World Bank.
- Valdes-Prieto, S. 1997. "Pension Reform in Latin America: Transition and Implementation Problems." Annals of Public and Cooperative Economics, forthcoming.
- World Bank 1994. Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth. Washington DC: World Bank and Oxford University Press.





# Policy Research Working Paper Series

Title	Author	Date	Contact for paper
WPS1746 The Role of Long-Term Finance: Theory and Evidence	Gerard Caprio, Jr. Asli Demirgüç-Kunt	April 1997	P. Sintim-Aboagye 38526
WPS1747 Protection and Trade in Services: A Survey	Bernard Hoekman Carlos A. Primo Braga	April 1997	J. Ngaine 37947
WPS1748 Has Agricultural Trade Liberalization Improved Welfare in the Least-Developed Countries? Yes	Merlinda D. Ingco	April 1997	J. Ngaine 37947
WPS1749 Applying Economic Analysis to Technical Assistance Projects	Gary McMahon	April 1997	C. Bernardo 37699
WPS1750 Regional Integration and Foreign Direct Investment: A Conceptual Framework and Three Cases	Magnus Blömmström Ari Kokko	April 1997	J. Ngaine 37947
WPS1751 Using Tariff Indices to Evaluate Preferential Trading Arrangements: An Application to Chile	Eric Bond	April 1997	J. Ngaine 37947
WPS1752 Ghana's Labor Market (1987–92)	Sudharshan Canagarajah Saji Thomas	April 1997	B. Casely-Hayford 34672
WPS1753 Can Capital Markets Create Incentives for Pollution Control?	Paul Lanoie Benoît Laplante	April 1997	R. Yazigi 37176
WPS1754 Research on Land Markets in South Asia: What Have We Learned?	Rashid Faruquee Kevin Carey	April 1997	C. Anbiah 81275
WPS1755 Survey Responses from Women Workers in Indonesia's Textile, Garment, and Footwear Industries	Mari Pangestu Medelina K. Hendytio	April 1997	J. Israel 85117
WPS1756 World Crude Oil Resources: Evidence from Estimating Supply Functions for 41 Countries	G. C. Watkins Shane Streifel	April 1997	J. Jacobson 33710
WPS1757 Using Economic Policy to Improve Environmental protection in Pakistan	Rashid Faruquee	April 1997	C. Anbiah 81275
WPS1758 The Restructuring of Large Firms in Slovakia	Simeon Djankov Gernard Pohl	April 1997	F. Hatab 35835
WPS1759 Institutional Obstacles to Doing Business: Region-by-Region Results from a Worldwide Survey of the Private Sector	Aymo Brunetti Gregory Kisunko Beatrice Weder	April 1997	M. Geller 31393

# Policy Research Working Paper Series

Title	Author	Date	Contact for paper
WPS1760 Credibility of Rules and Economic Growth: Evidence from a Worldwide Survey of the Private Sector	Aymo Brunetti Gregory Kisunko Beatrice Weder	April 1997	M. Geller 31393
WPS1761 Bending the Rules: Discretionary Pollution Control in China	Susmita Dasgupta Mainul Huq David Wheeler	May 1997	E. de Castro 89121
WPS1762 Strategies for Pricing Publicly Provided Health Services	Paul J. Gertler Jeffrey S. Hammer	May 1997	C. Bernardo 31148
WPS1763 China and the Multilateral Investment Guarantee Agency	Yushu Feng	May 1997	E. Beers 36175
WPS1764 A Reversal of Fortune for Korean Women: Explaining 1983's Upward Turn in Relative Earnings	Yaba vab der Neykeb Rodgers	May 1997	D. Ballantyne 87198
WPS1765 Explaining Agricultural and Agrarian Policies in Developing Countries	Hans P. Binswanger Klaus Deininger	May 1997	D. Housden 36637
WPS1766 New Systems for Old Age Security: Theory, Practice, and Empirical Evidence	Estelle James	May 1997	S. Khan 33651
WPS1767 Pension Reform: Is There a Tradeoff between Efficiency and Equity?	Estelle James	May 1997	S. Khan 33651